

Attorney Docket No.: 0140111

REMARKS

By the present amendment, claims 1, 9, and 16 have been amended. Thus, after the present amendment, claims 1-20 remain in the present application. Reconsideration and allowance of outstanding claims 1-20 in view of the above amendments and following remarks are requested.

A. Rejections of Claims 1-4, 6-13, 15-17, and 19-20 under 35 USC §102(e)

The Examiner has rejected claims 1-4, 6-13, 15-17, and 19-20 under 35 USC §102(e) as being anticipated by U.S. Patent Number 5,399,903 to Rostoker, et al. ("Rostoker"). For the reasons discussed below, Applicants respectfully submit that the present invention, as defined by amended independent claims 1, 9, and 16, is patentably distinguishable over Rostoker.

As disclosed in the present application, a surface mount component is situated over a substrate. The surface mount component has first and second terminals. First and second pads are situated on the substrate and are coupled to the first and second terminals, respectively. Solder mask trench 124 is situated underneath the surface mount component and is filled with a molding compound.

As shown in, for example, Figure 1 of the present application, solder mask trench 124 is formed within, i.e. between portions of, solder mask 112. By forming solder mask trench 124 underneath the surface mount component and within solder mask 112,

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moldable gap 125 is advantageously formed to be substantially larger than a conventional moldable gap.

For example, in a conventional structure, solder mask 112 would extend between pads 106 and 108 underneath the surface mount component. As a result, a conventional moldable gap that would be formed between solder mask 112 and the bottom surface of the surface mount component would have height 130, shown in Figure 1. However, by forming solder mask 124 within, i.e. between portions of, solder mask 112, embodiments according to the present invention advantageously achieve a significantly larger moldable gap, having height 128, that improves molding compound flow underneath the surface mount component and, consequently, minimizes void formation underneath the surface mount component. As a result, embodiments according to the present invention advantageously minimize the risk of shorting between the terminals of the surface mount component during, for example, reflow assembly. Thus, the reliability of the surface mount component is advantageously increased.

Applicants have amended independent claims 1, 9, and 16 to further illustrate aspects of the present invention. Amended independent claims 1, 9, and 16 recite language indicating that a solder mask trench situated underneath the surface mount component and is filled with molding compound, the solder mask trench being formed within a solder mask.

In contrast, Rostoker teaches a substrate including a non-conductive support layer and a plurality of conductive leads disposed thereon. The leads are arranged in a

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generally radial pattern about a central point on the support layer. Referring to Figure 6 of Rostoker, dollop 150 is formed on substrate 146. Dollop 150 is formed between conductive lead traces 148A and 148B. Semiconductor die 152 is attached to a top surface of dollop 150.

Rostoker does not disclose, teach, or suggest the solder mask trench, as defined by amended independent claims 1, 9, and 16, formed between solder mask 112 portions, as shown in Figure 1 of the present application. In other words, Rostoker does not teach a solder mask trench in a moldable gap that is filled with mold compound. Instead, referring to Figure 6 of Rostoker, Rostoker teaches dollop 150 formed on top of substrate 146, and semiconductor die 152 placed on top of substrate 146.

For the foregoing reasons, Applicants respectfully submit that the present invention as defined by amended independent claims 1, 9, and 16 is not taught, disclosed, or suggested by the art of record. Thus, amended independent claims 1, 9, and 16 are patentably distinguishable over the art of record. As such, the claims depending from amended independent claims 1, 9, and 16 are, *a fortiori*, also patentable for at least the reasons presented above and also for additional limitations contained in each dependent claim.

B. Rejections of Claims 5, 14, and 18 under 35 USC §103(a)

The Examiner has rejected claims 5, 14, and 18 under 35 USC §103(a) as being obvious with respect to Rostoker and U.S. Patent Number 5,969,461 to Anderson, et al.

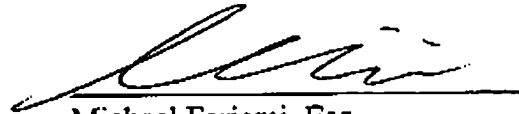
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("Anderson"). Applicant respectfully submits that claims 5, 14, and 18 depend from amended independent claims 1, 9, and 16, respectively, and thus, claims 5, 14, and 18 should be allowed at least for the same reasons discussed above in conjunction with patentability of amended independent claims 1, 9, and 16.

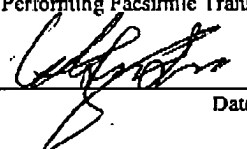
C. Conclusion

Based on the foregoing reasons, the present invention, as defined by amended independent claims 1, 9, and 16, and the claims depending therefrom, is patentably distinguishable over the art cited by the Examiner. Thus, outstanding claims 1-20 are patentably distinguishable over the art cited by the Examiner. As such, and for all the foregoing reasons, an early Notice of Allowance directed to all claims 1-20 remaining in the present application are respectfully requested.

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Respectfully Submitted,
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